

ABSTRACT

A method of producing a polymer-clay nanocomposite comprises providing a supply of polymer-clay mixture, exfoliating the mixture through solid-state shear pulverization in the presence of cooling sufficient to maintain the extruded mixture in the solid state during the pulverization, and discharging the resulting exfoliated mixture. The invention is also directed to a method of producing a polymer hybrid nanocomposite, wherein a component is dispersed throughout a polymer matrix by solid-state shear pulverization of a polymer mixed with the second component.